

KURT ET AL. -- 10/647,784
Client/Matter: 081468-0305598

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A lithographic projection apparatus, comprising:
a radiation system configured to provide a ~~projection~~ beam of radiation;
a support configured to support patterning device, the patterning device configured to pattern the ~~projection~~ beam of radiation according to a desired pattern;
a substrate table configured to hold a substrate;
a projection system configured to project the patterned beam onto a target portion of the substrate; and
at least one optical element on which the ~~projection~~ beam of radiation is incident having a Si/Mo multilayer structure, a capping layer, and an interlayer comprising C or Mo positioned between the multilayer structure and the capping layer, wherein the interlayer has a thickness of ~~between 6.0~~ greater than 7.0 and up to 9.0 nm.
2. (Currently amended) A lithographic projection apparatus according to claim 1, wherein the interlayer thickness is greater than 7.0 ~~between 6.5~~ and up to 8.5 nm.
3. (Currently amended) A lithographic projection apparatus according to claim 1, wherein the interlayer thickness is ~~between~~ greater than 7.0 and up to 8.0 nm.
4. (Currently amended) A lithographic projection apparatus according to claim 1, wherein the interlayer comprises Mo and has a thickness greater than 7.0 ~~of between 6.8~~ and up to 8.5 nm.
5. (Original) A lithographic projection apparatus according to claim 1, wherein the interlayer comprises Mo and has a thickness of between 7.2 and 8.0 nm.
6. (Currently amended) A lithographic projection apparatus according to claim 1, wherein the interlayer comprises C and has a thickness greater than 7.0 ~~of between 6.5~~ and up to 8.2 nm.

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7. (Currently amended) A lithographic projection apparatus according to claim 1, wherein the interlayer comprises C and has a thickness greater than ~~of between~~ 7.0 and up to 7.8 nm.
8. (Original) A lithographic projection apparatus according to claim 1, wherein the capping layer comprises Ru and has a thickness of between 1.0 and 3.0 nm.
9. (Original) A lithographic projection apparatus according to claim 1, wherein the capping layer comprises Ru and has a thickness of between 1.6 and 3.0 nm.
10. (Original) A lithographic projection apparatus according to claim 1, wherein the capping layer comprises Ru and has a thickness of at least 2.0 nm.
11. (Original) A lithographic projection apparatus according to claim 1, wherein the capping layer comprises Ru and has a thickness of at least 2.2 nm.
12. (Currently amended) A lithographic projection apparatus, comprising:
a radiation system configured to provide a ~~projection~~ beam of radiation;
a support configured to support a patterning device, the patterning device configured to pattern the ~~projection~~ beam according to a desired pattern;
a substrate table configured to hold a substrate;
a projection system configured to project the patterned beam onto a target portion of the substrate; and
at least one optical element on which the ~~projection~~ beam of radiation is incident having a Si/Mo multilayer structure, a capping layer, and an interlayer positioned between the multilayer structure and the capping layer, wherein the interlayer comprises an inner interlayer comprising Mo next to the multilayer structure and an outer interlayer comprising C next to the capping layer, the outer interlayer C has a thickness greater than 3.4 nm or the capping layer has a thickness greater than 2.0 nm and the combined thickness of the inner and outer interlayers greater than 7.0 and up to 9.0 nm.
13. (Canceled)

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14. (Original) A lithographic projection apparatus according to claim 12, wherein the outer interlayer has a thickness greater than 3.5 nm.
15. (Original) A lithographic projection apparatus according to claim 12, wherein the outer interlayer has a thickness greater than 3.7 nm.
16. (Original) A lithographic projection apparatus according to claim 12, wherein the outer interlayer has a thickness of less than 3.8 nm.
17. (Original) A lithographic projection apparatus according to claim 12, wherein the outer interlayer has a thickness of less than 3.4 nm.
18. (Original) A lithographic projection apparatus according to claim 12, wherein the capping layer has a thickness greater than 2.1 nm.
19. (Original) A lithographic projection apparatus according to claim 12, wherein the capping layer has a thickness greater than 2.2 nm.
20. (Original) A lithographic projection apparatus according to claim 12, wherein the inner interlayer has a thickness of between 3.0 and 4.0 nm.
21. (Original) A lithographic projection apparatus according to claim 12, wherein the inner interlayer has a thickness of 3.75 nm.
22. (Currently amended) A device manufacturing method, comprising:
 - ~~providing a substrate that is at least partially covered by a layer of radiation-sensitive material;~~
 - providing a ~~patterned~~ projection beam of radiation;
 - patterning the beam in its cross section;
 - projecting the ~~patterned~~ beam of radiation after it is patterned onto a target portion of [[the]] a layer of radiation-sensitive material at least partially covering a substrate using at least one optical element on which the projection beam of radiation is incident, wherein the at least one optical element has a Si/Mo multilayer structure, a capping layer, and an interlayer

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comprising C or Mo positioned between the multilayer structure and the capping layer, the interlayer has a thickness greater than 7.0 of between 6.0 and up to 9.0 nm.

23. (Currently amended) A device manufacturing method, comprising:
- ~~providing a substrate that is at least partially covered by a layer of radiation-sensitive material;~~
 - providing a ~~patterned~~ projection beam of radiation;
 - patterning the beam in its cross section;
 - projecting the ~~patterned~~ beam of radiation after it is patterned onto a target portion of ~~[[the]]~~ a layer of radiation-sensitive material at least partially covering a substrate using at least one optical element on which the ~~projection beam of radiation~~ is incident, wherein the at least one optical element has a Si/Mo multilayer structure, an outer capping layer, and an interlayer positioned between the multilayer structure and the outer capping layer, the interlayer comprises an inner interlayer comprising Mo next to the multilayer structure and an outer interlayer comprising C next to the capping layer, the outer interlayer has a thickness greater than 3.4 nm or the capping layer has a thickness greater than 2.0 nm and the combined thickness of the inner and outer interlayers greater than 7.0 and up to 9.0 nm.

24. (Currently amended) An optical element for use in a lithographic projection apparatus, the optical element comprising:

- a Si/Mo multilayer structure;
- a capping layer; and
- an interlayer positioned between the multilayer structure and the capping layer, wherein the interlayer comprises one of:
 - a layer comprising C or Mo, the layer having a thickness greater than 7.0 of between 6.0 and up to 9.0 nm; and
 - an inner interlayer comprising Mo next to the multilayer structure and an outer interlayer comprising C next to the capping layer, the outer interlayer having a thickness greater than 3.4 nm or the capping layer having a thickness greater than 2.0 nm and the combined thickness of the inner and outer interlayers greater than 7.0 and up to 9.0 nm.